

CLAIMS

1. A method of forming a polyethercarbonate polyol comprising the steps of:

- a) providing a multimetal cyanide compound having a crystalline structure and a content of platelet-shaped particles of at least 30% by weight, based on the weight of the multimetal cyanide compound and comprising at least two of the following: an organic complexing agent, water, a polyether, and a surface-active substance; and
- b) reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of the multimetal cyanide compound, thereby forming a polyethercarbonate polyol.

2. The method of claim 1, wherein step b) comprises reacting an alcohol initiator having a functionality of from 1 to 8 with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound.

3. The method of claim 1, wherein step b) comprises reacting an alcohol initiator having a functionality of from 1 to 4 with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound.

4. The method of claim 1, wherein step b) comprises reacting an alcohol initiator having a functionality of from 1 to 8 with at least one first alkylene oxide to form an oligomer and then reacting the oligomer with at least one second alkylene oxide and

carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound.

5 5. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with a plurality of alkylene oxides and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound.

10 6. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with propylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound.

15 7. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure of from 10 to 3,000 psi in the presence of said multimetal cyanide compound.

 8. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure of from 90 to 2,500 psi in the presence of said multimetal cyanide compound.

20 9. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure of from 90 to 2,000 psi in the presence of said multimetal cyanide compound.

10. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound at a temperature of from 40 to 180 °C.

5

11. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound at a temperature of from 90 to 130 °C.

10

12. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound to produce a polyethercarbonate polyol having a carbonate content of from 1 to 30 % calculated as the weight percent CO₃ in the polyethercarbonate polyol.

15

13. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of said multimetal cyanide compound to produce a polyethercarbonate polyol having a carbonate content of from 2 to 20 % calculated as the weight percent CO₃ in the polyethercarbonate polyol.

20

14. The method of claim 1, wherein step b) comprises reacting an alcohol
initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in
the presence of said multimetal cyanide compound to produce a polyethercarbonate
polyol having a carbonate content of from 5 to 15 % calculated as the weight percent CO₃
5 in the polyethercarbonate polyol.

15. The method of claim 1, wherein step b) comprises reacting an alcohol
initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in
the presence of said multimetal cyanide compound to produce a polyethercarbonate
10 polyol having a number average molecular weight of from 200 to 20,000Daltons.

16. The method of claim 1, wherein step b) comprises reacting an alcohol
initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in
the presence of less than or equal to 1.0 % by weight based on the weight of the
15 polyethercarbonate polyol of said multimetal cyanide compound.

17. The method of claim 1, wherein step b) comprises reacting an alcohol
initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in
the presence of less than or equal to 0.5 % by weight based on the weight of the
20 polyethercarbonate polyol of said multimetal cyanide compound.

18. The method of claim 1, wherein step b) comprises reacting an alcohol initiator with at least one alkylene oxide and carbon dioxide under a positive pressure in the presence of less than or equal to 0.02 % by weight based on the weight of the polyethercarbonate polyol of said multimetal cyanide compound.

5

19. The method of claim 1, wherein step a) comprises providing a multimetal cyanide compound having a crystalline structure and a content of platelet-shaped particles of at least 50% by weight, based on the weight of said multimetal cyanide compound and comprising at least two of the following: an organic complexing agent, water, a polyether, and a surface-active substance.

10

20. The method of claim 1, wherein step a) comprises providing a multimetal cyanide compound having a crystalline structure and a content of platelet-shaped particles of at least 70% by weight, based on the weight of said multimetal cyanide compound and comprising at least two of the following: an organic complexing agent, water, a polyether, and a surface-active substance.

15